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10/564,469	01/13/2006	Soichi Shibata	043888-0432	9397

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EXAMINER	
RADEMAKER, CLAIRE L	
ART UNIT	PAPER NUMBER
1795	
MAIL DATE	DELIVERY MODE
06/23/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/564,469	SHIBATA ET AL.	
	Examiner	Art Unit	
	CLAIRE L. RADEMAKER	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *3/6/2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 4-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 4-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This office action is in response to the amendment filed on March 6, 2009. Claims 1 & 4-6 are pending and are rejected for reasons of record. Claims 2-3 are cancelled.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 and 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (JP 11-354143) in view of Imamura et al. (US 2004/0038098) and Simpson et al. (US 2004/0197614).

With regard to claim 1, Saito teaches a fuel cell system (paragraph [011]; Figure 1) comprising a fuel cell (20, paragraph [0011]; Figure 1), a fuel gas supply means (1, paragraph [0012]; Figure 1) for supplying a fuel gas to an anode of said fuel cell, an oxidant gas supply means (8, paragraph [0015]; Figure 1) for supplying an oxidant gas to a cathode of said fuel cell, and an inert gas supply means (32, paragraph [0016]; Figure 1) for supplying an inert gas to the anode of said fuel cell (paragraphs [0008], [0010], [013], & [0017]; Figure 1), where said fuel cell is subjected to a purge operation

of replacing the fuel gas and in said fuel cell with an inert gas supplied from said inert gas supply means when said fuel cell is started up or shut down (paragraphs [0008], [0010], [013], & [0017]), wherein said fuel cell system further comprises control means (46, paragraph [0016]; Figure 1) for controlling the flow rate of the purge gas supplied to said fuel cell (paragraph [0016]; Figure 1), but fails to teach a means for measuring pressure at the inlet-side flow paths leading to the anode and the cathode of said fuel cell or a means for variably controlling the flow rate of the purge gas.

Imamura et al. teaches means for measuring a pressure P_a in an inlet-side flow path leading to the anode of said fuel cell (81, paragraph [0120]; Figure 9) and a pressure P_c in an inlet-side flow path leading to the cathode (71, paragraph [0120]; Figure 9) in order to better control the pressure / flow rate and thereby limit the water diffusion from the air electrode side through the electrolyte membrane to the fuel electrode side (paragraph [0058]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the means for measuring pressures at the inlet-side flow paths leading to the anode and the cathode of Imamura et al. to the fuel cell system of Saito in order better control the pressure / flow rate and thereby limit the water diffusion from the air electrode side through the electrolyte membrane to the fuel electrode side (paragraph [0058]).

Furthermore, it is noted that Imamura et al. teaches that the differential pressure ΔP can be defined as $\Delta P = P_a - P_c$ (paragraphs [0057]-[0058]) and that this relationship prevents water residence around the electrode portions of the fuel electrode (paragraph

[0058]). Furthermore, while Imamura et al. fails to specifically state that $0 < \Delta P_o$, one of ordinary skill in the art would understand that because ΔP can be defined as $\Delta P = P_a - P_c$ where $P_a > P_c$ (Imamura et al., paragraphs [0057]-[0058]), ΔP_o can be greater than 0 (zero).

Modified Saito fails to teach a means for variably controlling the flow rate of the purge gas.

Simpson et al. teaches a fuel cell system (paragraph [0017]; Figure 1) comprising a means for variably controlling the flow rate of a purge gas (72, paragraphs [0045], [0049]-[0050], & [0039]; Figure 1) in order to maintain the desired pressure in the fuel cell system.

It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the means controlling the flow rate of the purge gas supplied to said fuel cell of Saito with the means for variably controlling the flow rate of the purge gas of Simpson et al. in order to maintain the desired pressure in the fuel cell system.

It is noted that with regard to the purge operation and the normal operation of the fuel cell system, the limitations have been considered with regard to structure, but the operation (method) is not given patentable weight (MPEP 2106 & 2111.02). Claim 1 is drawn to a fuel cell system, which is considered a product.

With regard to claim 4, modified Saito fails to teach means for changing the internal diameter of an outlet-side flow path of an exhaust gas.

Simpson et al. teaches a fuel cell system (paragraph [0017]; Figure 1) comprising a means for changing the internal diameter of an outlet-side flow path of an exhaust gas from said fuel cell at least in stages (52 & 72, paragraphs [0045], [0049]-[0050], & [0039]; Figure 1) during the purge operation of said fuel cell (paragraphs [0045] & [0049]-[0050]) in order to maintain the desired pressure in the fuel cell system.

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the means for changing the internal diameter of an outlet-side flow path of an exhaust gas from said fuel cell at least in stages during purge operation of said fuel cell of Simpson et al. to the fuel cell system of modified Saito in order to maintain the desired pressure in the fuel cell system.

It is noted that with regard to the purge operation of the fuel cell system, the limitations have been considered with regard to structure, but the operation (method) is not given patentable weight (MPEP 2106 & 2111.02). Claims 1 & 4 are drawn to a fuel cell system, which is considered a product.

With regard to claims 5-6, it is noted that the fuel cell system has been considered with regard to structure and that the term “configured to” has been given patentable weight with regard to structure, but not with regard to process (method) steps involved.

The process step “perform the purge operation for shutting down [or starting up] said fuel cell by:”

The process step “comparing the pressure Pa in the inlet-side flow path leading to the anode and the pressure Pc in the inlet-side flow path leading to the cathode" contains functional language which does not impact the structure of the fuel cell system. Structurally, this limitation requires that the fuel cell system of claim 1 contains an inlet-side flow path leading to the anode, an inlet-side flow path leading to the cathode, and pressure sensors. Modified Saito teaches that the fuel cell can comprise a means for measuring a pressure P_a in an inlet-side flow path leading to the anode of said fuel cell (Imamura et al.; 81, paragraph [0120]; Figure 9) and a pressure P_c in an inlet-side flow path leading to the cathode (Imamura et al.; 71, paragraph [0120]; Figure 9) in order to better control the pressure / flow rate and thereby limit the water diffusion from the air electrode side through the electrolyte membrane to the fuel electrode side (Imamura et al; paragraph [0058]); and

The process steps “increasing in stages the flow rate of the inert gas supplied to one of the inlet-side flow paths, one having a larger pressure” and “increasing in stages the flow rate of the inert gas supplied to the other one of the inlet-side flow paths, the one having a smaller pressure” both contain functional language which do not impact the structure of the fuel cell system. Structurally, these limitations require that the fuel cell system comprise a means for variably controlling the flow rate of a purge gas. Modified Saito teaches that the fuel cell system comprise a means for variably controlling the flow rate of a purge gas

(Simpson et al.; 72, paragraphs [0045], [0049]-[0050], & [0039]; Figure 1) in order to maintain the desired pressure in the fuel cell system; and

The process step “terminate the purge operation by:”

The process step “closing the communication between the inlet-side flow path having a smaller pressure and a flow path for supplying the inert gas” and “and then closing the communication between the inlet-side flow path having a larger pressure and the flow path for supplying the inert gas” contain functional language which do not impact the structure of the fuel cell system. Structurally, these limitations require that the fuel cell system comprise a means for variably controlling the flow rate of a purge gas, where said means for variably controlling the flow rate can be closed. Modified Saito teaches that the fuel cell system comprise a means for variably controlling the flow rate of a purge gas (Simpson et al.; 72, paragraphs [0045], [0049]-[0050], & [0039]; Figure 1) in order to maintain the desired pressure in the fuel cell system. One of ordinary skill in the art would understand from the disclosure of Simpson et al. that the means for variably controlling the flow rate of a purge gas could be closed if needed / desired.

It has been held that while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function (MPEP 2114). Furthermore, it has been held that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not

differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim (MPEP 2114).

Response to Arguments

Claim Rejections - 35 USC § 103

3. Applicant's arguments with respect to claims 1 & 4-6, filed on March 6, 2009, have been considered but are moot in the view of the new ground(s) of rejection. The new grounds of rejection are necessitated by the Applicant's amendment and all arguments are directed toward the added / new claims 5-6.

On pages 5-6 of the Applicant's Response, Applicants argue that "the limitations recited in the last paragraph of claim 1 are limiting on the claimed fuel cell system and are nonobvious in view of the cited art" (Applicant's Response, page 5) and that the specified function of variably controlling the flow rate of the inert gas supplied to said fuel cell based on the values of Pa and Pc during the purge operation of said fuel cell, such that the relation $0 < \Delta P_o \times \Delta P_p$ and $|\Delta P_p| < |\Delta P_o|$ is always satisfied" is limiting on the claimed structure (Applicant's Response, page 6).

In response to the Applicant's argument that "the limitations recited in the last paragraph of claim 1 are limiting on the claimed fuel cell system and are nonobvious in view of the cited art" (Applicant's Response, page 5) and that the specified function of variably controlling the flow rate of the inert gas supplied to said fuel cell based on the

values of Pa and Pc during the purge operation of said fuel cell, such that the relation 0 < ΔP_o x ΔP_p and $|\Delta P_p| < |\Delta P_o|$ is always satisfied" is limiting on the claimed structure (Applicant's Response, page 6), the Examiner would like to note that it has been held that while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function (MPEP 2114). Furthermore, it has been held that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim (MPEP 2114). Therefore, with regard to the purge operation of the fuel cell system, the limitations have been considered with regard to structure, but the operation (method) is not given patentable weight (MPEP 2106 & 2111.02). Claims 1 & 4-6 are drawn to a fuel cell system, which is considered a product.

On pages 6-7 of the Applicant's Response, Applicants argue that "Imamura *avoids* the use of a purge operation, does not disclose employing inlet-side pressure sensors 71 and 81 for a purge operation, and thus does not suggest that pressure sensors might be employed for 'variably controlling the flow rate of the inert gas supplied to said fuel cell based on the values of Pa and Pc *during the purge operation* of said fuel cell" (Applicant's Response, page 7).

In response to the Applicant's argument that "Imamura *avoids* the use of a purge operation, does not disclose employing inlet-side pressure sensors 71 and 81 for a purge operation, and thus does not suggest that pressure sensors might be employed for 'variably controlling the flow rate of the inert gas supplied to said fuel cell based on the values of Pa and Pc *during the purge operation* of said fuel cell" (Applicant's Response, page 7), the Examiner notes that Imamura et al. is used only to teach means for measuring a pressure P_a in an inlet-side flow path leading to the anode of said fuel cell and a pressure P_c in an inlet-side flow path leading to the cathode (see paragraph 2 above for details). While Imamura does not specifically state that the means for measuring pressures (71, 72, 81, & 82; paragraph [0121]; Figure 9), the control unit, and the means for variably controlling the flow rate are used in the specified manner, it would have been obvious to one of ordinary skill in the art at the time of the invention to use readings from all four means for measuring pressures (71, 72, 81, & 82; paragraph [0121]; Figure 9) in order to enable a more accurate and precise flow rate adjustment.

Furthermore, with regard to the rejections in this Office Action (see above), it is noted that with regard to the purge operation and the normal operation of the fuel cell system, the limitations have been considered with regard to structure, but the operation (method) is not given patentable weight (MPEP 2106 & 2111.02). Claims 1 & 4-6 are drawn to a fuel cell system, which is considered a product.

Furthermore, it is noted that the fuel cell system of modified Saito would be capable of measuring a pressure Pa in an inlet-side flow path leading to the anode of said fuel cell, measuring a pressure Pc in an inlet-side flow path leading to the cathode

of said fuel cell, and variably controlling the flow rate of the inert gas supplied to said fuel cell based on the values of Pa and Pc during a purge operation of said fuel cell.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLAIRE L. RADEMAKER whose telephone number is (571)272-9809. The examiner can normally be reached on Monday - Friday, 8:00AM - 4:30PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. L. R./
Examiner, Art Unit 1795

/Alexa D. Neckel/
Supervisory Patent Examiner, Art Unit 1795